

**NORTH CAROLINA DIVISION OF
AIR QUALITY
Application Review**

Region: Winston-Salem Regional Office
County: Guilford
NC Facility ID: 4100923
Inspector's Name: Robert Barker
Date of Last Inspection: 09/06/2022
Compliance Code: 3 / Compliance - inspection

Issue Date: TBD

<p style="text-align: center;">Facility Data</p> <p>Applicant (Facility's Name): City of Greensboro – T.Z. Osborne Water Reclamation Facility</p> <p>Facility Address: City of Greensboro - T.Z. Osborne Water Reclamation Facility 2350 Huffine Mill Road McLeansville, NC 27301</p> <p>SIC: 4953 / Refuse Systems NAICS: 562213 / Solid Waste Combustors and Incinerators</p> <p>Facility Classification: Before: Title V After: Title V Fee Classification: Before: Title V After: Title V</p>	<p style="text-align: center;">Permit Applicability (this application only)</p> <p>SIP: 02D .0524, 02D .0614, 02D .1110, 02D .1204 NSPS: Subpart O NESHAP: n/a PSD: Minor source PSD Avoidance: 02Q .0317 NC Toxics: n/a 112(r): n/a Other: 40 CFR Part 62, Subpart LLL</p>
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Contact Data			Application Data
<p style="text-align: center;">Facility Contact</p> <p>Bradley Flynt Water Reclamation Superintendent (336) 433-7262 2350 Huffine Mill Road McLeansville, NC 27301</p>	<p style="text-align: center;">Authorized Contact</p> <p>Elijah Williams, PE Water Reclamation Manager (336) 373-2055 2350 Huffine Mill Road McLeansville, NC 27301</p>	<p style="text-align: center;">Technical Contact</p> <p>Bradley Flynt Water Reclamation Superintendent (336) 433-7262 2350 Huffine Mill Road McLeansville, NC 27301</p>	<p>Application Numbers: 4100923.21C, .22A, .22B, .23A, .23B Date Received: 8/20/21; 4/5/22; 7/19/22; 4/19/22; 6/20/23 Application Type: Modification Application Schedule: TV-Significant Existing Permit Data Existing Permit Number: 04489/T28 Existing Permit Issue Date: 04/20/2022 Existing Permit Expiration Date: 06/30/2026</p>

Total Actual emissions in TONS/YEAR:

CY	SO ₂	NO _X	VOC	CO	PM ₁₀	Total HAP	Largest HAP
2021	0.3100	17.61	8.70	10.68	0.5600	8.50	4.21 [Dichlorobenzene(p), 1,4-]
2020	3.33	19.10	8.53	11.33	0.4500	8.32	4.11 [Dichlorobenzene(p), 1,4-]
2019	6.77	32.51	17.24	11.75	0.5700	16.65	9.28 [Dichlorobenzene(p), 1,4-]
2018	4.47	20.73	7.79	6.93	0.6100	6.96	3.07 [Dichlorobenzene(p), 1,4-]
2017	0.6950	6.79	7.35	1.31	0.5800	7.39	3.78 [Dichlorobenzene(p), 1,4-]

<p>Review Engineer: Russell Braswell</p> <p>Review Engineer's Signature: _____ Date: _____</p>	<p style="text-align: center;">Comments / Recommendations:</p> <p>Issue 04489/T29 Permit Issue Date: TBD Permit Expiration Date: June 30, 2026</p>
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1.0 Purpose of Applications

1.1 Application 4100923.21C

City of Greensboro - T.Z. Osborne Water Reclamation Facility (TZO; the facility) operates a wastewater treatment plant consisting of two sewage sludge incinerators (SSI) and activities that support the SSIs. The SSIs are each controlled by scrubbers. TZO operates under Title V Air Quality Permit 04489T28.

The facility is subject to 15A NCAC 02D .1204 “Sewage Sludge Incineration Units.” Currently, TZO demonstrates compliance with this rule by (among other activities) manually monitoring the pH of the liquid within the scrubber that controls emissions from the SSIs. TZO submitted this application to allow for using an SO₂ CEMS in place of the pH monitoring.

TZO submitted this application as a one-step significant modification under 15A NCAC 02Q .0516 and 02Q .0501(c)(1).

During the processing of this application, DAQ identified two issues with the Title V permit that will be addressed at this time:

1. The existing permit does not include a reference to 40 CFR Part 62, Subpart LLL. This rule applies to TZO, and is enforceable by DAQ through a memorandum of understanding. Therefore, the new permit must include a specific condition for this rule.
2. The existing permit includes a permit shield for CAM based on the fact the existing facility is not a major source as defined in 40 CFR 70.2. As discussed below, this is not sufficient to avoid CAM applicability under 15A NCAC 02D .0614(a). The permit shield for CAM is therefore inaccurate. CAM applicability will be re-examined.

DAQ determined that item #2 above must be addressed through a “reopen for cause” application under 15A NCAC 02Q .0517. DAQ initiated application .23B in order to process the reopen for cause application.

1.2 Application 4100923.22A

In order to comply with 15A NCAC 02D .1204, TZO monitors and maintains certain parameters according to the results of emission testing. Based on the results of a recent emission test (test reference number 2022-005ST), TZO has requested several parameters listed in the permit be updated.

TZO submitted this application as a minor modification under 15A NCAC 02Q .0515.

This application will be consolidated into application .21C.

1.3 Application 4100923.22B

Similar to Application .22A, TZO has requested several parameters listed in the permit be updated based on the results of a recent emission test (test reference number 2022-051ST).

TZO submitted this application as a one-step significant modification under 15A NCAC 02Q .0516 and 02Q .0501(c)(1).

This application will be consolidated into application .21C.

1.4 Application 4100923.23A

Similar to Application .22A, TZO has requested several parameters listed in the permit be updated based on the results of a recent emission test (test reference number 2023-018ST).

TZO submitted this application as a minor modification under 15A NCAC 02Q .0515.

This application will be consolidated into application .21C.

1.5 Application 4100923.23B

As discussed above, DAQ has determined that existing permit includes a material mistake: the permit includes an inaccurate permit shield for 15A NCAC 02D .0614. Therefore, as required by 15A NCAC 02Q .0517(a)(3), DAQ initiated a “reopen for cause” application to address this mistake. In order to correct this mistake, DAQ must remove the permit shield for 15A NCAC 02D .0614.

Without the permit shield for 15A NCAC 02D .0614, CAM applicability was re-examined. It was determined that CAM does apply to this facility. Therefore, in addition to removing the inaccurate permit shield, DAQ requested TZO submit a CAM plan as required by 15A NCAC 02D .0614 and 40 CFR 64.5(c).

2.0 Application Chronology

Date	Event
August 20, 2021	Application .21C received.
October 21, 2021	Application .21D received.
April 5, 2022	Application .22A received.
April 20, 2022	Permit T28 issued in response to Application .21D.
July 19, 2022	Application .22B received.
October 18, 2022	Applications transferred to Russell Braswell.
February 3, 2023	Initial internal draft sent to RCO Permits staff.
March 10, 2023	Comments received on initial draft.
March 15, 2023	Updated draft sent to RCO SSCB, WSRO, and TZO staff.
March 29, 2023	Email sent to TZO explaining that a CAM plan would be required before the permit can be issued.
April 17, 2023	Letter sent to TZO via email stating that the Title V permit must be reopened for cause, and informing TZO that this process would begin in 60 days unless the 60-day period was waived by TZO.
April 19, 2023	Application .23A received.
June 19, 2023	DAQ opened application .23B (note that TZO did not waive the 60-day period for reopen for cause).
June 20, 2023	Email sent to TZO requesting that TZO develop and submit a CAM plan.
June 21, 2023	Response received to the June 20 request. TZO submitted a CAM plan as requested.
June 23, 2023	Email sent to TZO regarding the proposed CAM plan. The proposed CAM plan did not include an indicator for the scrubber CD-21.
June 26, 2023	Response received to the June 23 request. After additional discussion between TZO and DAQ, TZO updated the proposed CAM plan to include an indicator for the scrubber CD-21.
June 27, 2023	Updated draft sent to RCO Permits staff and RCO SSCB staff.

Date	Event
June 28, 2023	Updated draft sent to DAQ WSRO staff and TZO staff.
XXXXXX	Public notice / EPA review
XXXXXX	Permit issued.

3.0 Regulatory Overview

TZO is subject to the following rules, in addition to the General Conditions:

- 15A NCAC 02D .0515 “Particulates from Miscellaneous Industrial Sources”
- 15A NCAC 02D .0516 “Sulfur Dioxide from Combustion Sources”
- 15A NCAC 02D .0521 “Control of Visible Emissions”
- 15A NCAC 02D .0524 “New Source Performance Standards”
(40 CFR Part 60, Subparts O and IIII)
- 15A NCAC 02D .0614 “Compliance Assurance Monitoring”
- 15A NCAC 02D .1110 “National Emission Standards for Hazardous Air Pollutants”
(40 CFR Part 61, Subparts C and E)
- 15A NCAC 02D .1111 “Maximum Achievable Control Technology”
(40 CFR Part 63, Subpart ZZZZ)
- 15A NCAC 02D .1204 “Sewage Sludge Incineration Units” [State-enforceable Only]
- 15A NCAC 02Q .0315 “Synthetic Minor Facilities”
- 15A NCAC 02Q .0317 “Avoidance Conditions”
- 40 CFR Part 503, Subpart E “Standards for the Use or Disposal of Sewage Sludge: Incineration”
- 40 CFR Part 62, Subpart LLL “Federal Plan Requirements for Sewage Sludge Incineration Units
Constructed on or Before October 14, 2010”

Note that 40 CFR Part 503, Subpart E and 40 CFR Part 62, Subpart LLL are not incorporated into North Carolina’s SIP.

In addition to the above rules, the potential applicability of 02D .0614 “Compliance Assurance Monitoring” and 02Q .0512 “Permit Shield and Application Shield” must be discussed as part of this permit revision.

The changes made by this permit revision will not affect TZO’s compliance requirements for the following rules: 02D .0515, 02D .0516, 02D .0521, 02Q .0315, 02Q .0317, NSPS Subpart IIII, MACT Subpart ZZZZ, and 40 CFR Part 503, Subpart E. These rules will not be discussed further.

4.0 Rules Review

4.1 15A NCAC 02D .0524 “New Source Performance Standards” (NSPS)

This rule incorporates the NSPS rules in 40 CFR Part 60 into North Carolina’s SIP. There are two NSPS rules that apply to this facility: Subpart O and Subpart IIII. TZO’s requirements under NSPS Subpart IIII are not changing as part of this modification, and will not be discussed further.

4.1.1 NSPS Subpart O “Standards of Performance for Sewage Treatment Plants”

Applicability: This rule applies to facilities that operate SSIs constructed after June 11, 1973. Both SSIs at this facility are subject to this rule.

Emission limit: 1.3 pounds of particulate matter per ton of dry sludge input.

Compliance requirements: This rule requires facilities to install a pressure monitor on the scrubbers and an oxygen monitor on the SSIs. The appropriate values for scrubber pressure and SSI oxygen content are determined by testing. TZO performed emission testing in 2022, and as a result must incorporate the new tested values into the permit.

ID No.	Parameter	New Value	Requested in Application
ES-20	Maximum oxygen content	11.1%	.22A
CD-21	Minimum pressure drop	8.1 inches of water column	
ES-1	Maximum oxygen content	11.8% ¹	.23A
CD-22	Minimum pressure drop	37 inches of water column	.22B & .23A

Changes to the existing permit: Based on the above discussion, the oxygen content and pressure drops listed in paragraph 2.1 A.2.i.i and ii will be updated with the values listed in the .22A and .22B applications.

4.2 15A NCAC 02D .0614 “Compliance Assurance Monitoring”

4.2.1 Background

The compliance assurance monitoring (CAM) rule requires owners and operators to conduct monitoring to provide a reasonable assurance of compliance with applicable requirements under the act. Per 02D .0614(a), this rule potentially applies to any facility required to obtain a permit under 02Q .0500 (*i.e.*, a Title V permit). Monitoring focuses on emissions units that rely on pollution control device equipment to achieve compliance with applicable standards.

It should be noted that the existing permit includes a “permit shield” as allowed by 02Q .0512, which states:

2.3 A.1: 15A NCAC 02D .0614, “Compliance Assurance Monitoring” for each of these sources is not applicable, because the Permittee has avoided becoming a “major source” under Title V by establishing (obtaining) a synthetic minor limitation under 15A NCAC 02Q .0315, “Synthetic Minor Facilities.”

As a result of the permit shield, TZO has not been reviewed for CAM applicability. However, the permit shield is erroneous. Under 02D .0614(a), a facility’s status as a major source under Title V is not relevant; all that matters is that a facility is required to obtain a permit under 02Q .0500 (*i.e.*, a Title V permit).² It is true that TZO is not a major source per the definition in 40 CFR 70.2, but TZO is still required to obtain a Title V permit per 40 CFR 62.16035. Therefore, the above permit shield will be removed from the permit. Furthermore, CAM applicability must now be addressed.

¹ TZO requested a different value for this parameter in the .22B application. However, the .23A application requested this value based on the most recent stack test result.

² Note that the CAM rule under 40 CFR Part 64 has a slightly different applicability requirement. Per 40 CFR 64.2(a), CAM applies to facilities that are required to obtain a Title V permit *and* are also major sources. Going by the applicability requirement in 40 CFR 64.2(a), CAM would not apply to this facility. However, NC’s SIP rule for CAM does not reference 40 CFR 64.2. Instead, NC’s SIP rule sets a separate applicability requirement under 02D .0614(a).

4.2.2 CAM Applicability

An emission unit located at a facility required to obtain a permit under 02Q .0500 is subject to CAM if all of the following three conditions are met:

- I. The unit is subject to any (non-exempt, e.g., pre-November 15, 1990, Section 111 or 112 standard) emission limitation or standard for the applicable regulated pollutant.
- II. The unit uses any control device to achieve compliance with any such emission limitation or standard.
- III. The unit's pre-control potential emission rate exceeds 100 percent of the amount required for a source to be classified as a major source, i.e., either 100 tpy (for criteria pollutants) or 10 tpy of any individual/25 tpy of any combination of HAP.

This facility is required to obtain a permit under 02Q .0500. Therefore, CAM applicability must be examined for any emission source with a control device. The relevant emission sources are the two SSIs (ES-1 and ES-20) and the storage silo (ES-17).

Emission limits exempt from CAM: Several emission standards are exempt from CAM applicability under 02D .0614(b)(1):

- Per 02D .0614(b)(1)(E), a limit that is an emission cap under Chapters 02D or 02Q is exempt from CAM applicability. The emission limits under 02Q .0315 and 02Q .0317 are emission caps, and therefore cannot trigger CAM applicability. Those limits will not be addressed further.
- Per 02D .0614(b)(1)(A), a limit that was proposed after November 15, 1990 and pursuant to Section 111 or 112 of the Clean Air Act is exempt from CAM applicability. 40 CFR Part 62, Subpart LLL was proposed pursuant to Section 111 and after that date, and therefore cannot trigger CAM.
- The definition of "applicable requirement" in 40 CFR 64.2 specifies standards that are included under an applicable implementation plan approved by EPA. 15A NCAC 02D .1204 is not part of North Carolina's approved state implementation plan (SIP), and therefore is not an applicable requirement for CAM.

Applicable CAM emission limits: The emission limits in 02D .0515, 02D .0516, NSPS Subpart O (incorporated into the permit under 02D .0524), and NESHAP Subparts C and E (incorporated into the permit under 02D .1110) are applicable requirements because those rules are part of North Carolina's SIP.

4.2.3 CAM Applicability for Silo (ES-17)

Pre-control potential emissions of PM₁₀ (the only pollutant expected from a sand silo) from the sand silo can be calculated using the emission factor in AP-42 Chapter 11.12-2 for pneumatic cement unloading³ and a maximum silo loading rate of 24 tons per hour.⁴

$$\left(0.47 \frac{\text{lb}_{\text{PM}_{10}}}{\text{ton}_{\text{loaded}}}\right) \times \left(24 \frac{\text{ton}_{\text{loaded}}}{\text{hr}}\right) \times \left(8,760 \frac{\text{hr}}{\text{yr}}\right) / \left(2,000 \frac{\text{lb}}{\text{ton}}\right) = 49.41 \frac{\text{ton}_{\text{PM}_{10}}}{\text{yr}}$$

The major source threshold for PM₁₀ is 100 tpy. Based on the above calculations, the silo ES-17 does not have pre-control potential emissions greater than the major source threshold. Therefore, the silo cannot trigger CAM per item III above.

4.2.4 CAM Applicability for SSIs (ES-1 and ES-20)

CAM can only apply to an emission source if it uses a control device to comply with an emission limit. The SSIs use control devices to comply with emission limits for PM, SO₂, beryllium, and mercury (as discussed above, other emission limits for the SSIs are not applicable CAM requirements). If the potential emissions of these pollutants from the SSIs are greater than the major source thresholds (100, 100, 10, and 10 tpy, respectively), then CAM applicability will be triggered.

4.2.4.1 PM (PM₁₀ and PM_{2.5}) from SSIs

Emission testing was recently performed at Metropolitan Sewerage District of Buncombe County. That facility operates a fluidized bed incinerator (FBI), which is the same type of SSI used at TZO. The emission test result showed an emission rate of condensable particulate matter (CPM)⁵ of 0.124 pounds of CPM per hour, while incinerating 1.2 dry tons of sludge per hour. The FBI at Buncombe County was equipped with a venturi scrubber with an advertised CPM control efficiency of 99%.⁶ Using this information, a pre-control CPM emission factor for FBIs can be determined:

$$\left(0.124 \frac{\text{lb}_{\text{CPM}}}{\text{hr}}\right) / \left(1.2 \frac{\text{ton}_{\text{sludge}}}{\text{hr}}\right) / (1 - 99\%_{\text{cont. eff.}}) = 10.3 \frac{\text{lb}_{\text{CPM}}}{\text{ton}_{\text{sludge}}}$$

Using the emission factor of 10.3 lb/ton, the minimum sludge incineration rate that triggers CAM can be determined:

$$\left(100 \frac{\text{ton}_{\text{PM}}}{\text{yr}}\right) \times \left(2,000 \frac{\text{lb}_{\text{PM}}}{\text{ton}_{\text{PM}}}\right) / \left(10.3 \frac{\text{lb}_{\text{PM}}}{\text{ton}_{\text{sludge}}}\right) / \left(8,760 \frac{\text{hr}}{\text{yr}}\right) = 2.21 \frac{\text{ton}_{\text{sludge}}}{\text{hr}}$$

Therefore, any fluidized bed-type SSI with a capacity greater than 2.21 tons of sludge per hour has a potential emission rate of *at least* 100 tpy of PM₁₀/PM_{2.5}, and will therefore trigger CAM applicability for PM₁₀/PM_{2.5}. Note that this is an upper bound because it does not consider filterable PM. If filterable PM is

³ Not the emission factor for sand transfer, because that factor is specifically for conveyor transfer, which is different from pneumatic transfer (see AP-42 Chapter 11.12, Fig. 1).

⁴ Process rate taken from comments submitted by Keith McCulloch (Director/Principal for GEL Engineering, a firm representing TZO) to Russell Braswell (Engineer, DAQ). See Section 7.4, below.

⁵ 100% of CPM is assumed to be PM₁₀ and PM_{2.5}.

⁶ The venturi scrubber was manufactured by EnviroCare International, Inc, model name "VenturiPak."

also considered, then the process rate that triggers CAM applicability for PM₁₀/PM_{2.5} emissions would be even lower.

Both of the SSIs at this facility have a capacity greater than 2.21 tons per hour, and therefore both will trigger CAM applicability for potential PM emissions.

4.2.4.2 SO₂ from SSIs

According to AP-42 Table 2.2-6, an uncontrolled FBI has an SO₂ emission factor of 0.3 pounds of SO₂ per ton of sludge incinerated. Based on this uncontrolled emission rate, the minimum sludge incineration rate that triggers CAM can be determined:

$$\left(100 \frac{\text{ton}_{\text{SO}_2}}{\text{yr}}\right) \times \left(2,000 \frac{\text{lb}_{\text{SO}_2}}{\text{ton}_{\text{SO}_2}}\right) / \left(0.3 \frac{\text{lb}_{\text{SO}_2}}{\text{ton}_{\text{sludge}}}\right) / \left(8,760 \frac{\text{hr}}{\text{yr}}\right) = 76.1 \frac{\text{ton}_{\text{sludge}}}{\text{hr}}$$

Neither of the SSIs at this facility have a capacity greater than 76.1 tons per hour, and therefore neither SSI will trigger CAM applicability for potential SO₂ emissions.

4.2.4.3 Beryllium and mercury from SSIs

TZO recently performed emission testing for these pollutants emitted from the SSI ID No. ES-1 (test reference number 2021-120ST). The post-control emission rates were:

- Process rate: 5,025 lb/hr
- Beryllium: 2.10 E-05 lb/day⁷ (3.48 E-07 lb_{Be}/ton_{sludge}, based on the process rate)
- Mercury: 1.66 E-02 lb/day (2.75 E-04 lb_{Hg}/ton_{sludge}, based on the process rate)

Note that these factors are post-control: because CAM is triggered based on pre-control potential emissions, a pre-control emission factor must be determined.

The SSI ID No. ES-1 is controlled by a “multiple Venturipak scrubber” manufactured by EnviroCare International, Inc.⁸ The manufacturer claims a control efficiency for heavy metals up to 99%. Assuming a control efficiency of 99% (the most conservative approach for this method), the pre-control emission factor for these pollutants can be determined:

$$\text{Pre-control EF} = \frac{(\text{Post-control EF})}{(1 - \text{Control Efficiency})}$$

$$\text{Be} = 3.48\text{E-}05 \text{ lb/ton}_{\text{sludge}} \quad \text{Hg} = 2.75\text{E-}02 \text{ lb/ton}_{\text{sludge}}$$

Using the above emission factors for beryllium and mercury, the minimum sludge incineration rate that triggers CAM for those pollutants can be determined:

⁷ Test result was below detectable limit, the detectable limit was reported as the test result.

⁸ This is the same control device as mentioned in note 6.

$$\text{Be: } \left(10 \frac{\text{ton}_{\text{Be}}}{\text{yr}}\right) \times \left(2,000 \frac{\text{lb}_{\text{Be}}}{\text{ton}_{\text{Be}}}\right) / \left(3.48\text{E} -05 \frac{\text{lb}_{\text{Be}}}{\text{ton}_{\text{sludge}}}\right) / \left(8,760 \frac{\text{hr}}{\text{yr}}\right) = 65,606 \frac{\text{ton}_{\text{sludge}}}{\text{hr}}$$
$$\text{Hg: } \left(10 \frac{\text{ton}_{\text{Hg}}}{\text{yr}}\right) \times \left(2,000 \frac{\text{lb}_{\text{Hg}}}{\text{ton}_{\text{Hg}}}\right) / \left(2.75\text{E} -02 \frac{\text{lb}_{\text{Hg}}}{\text{ton}_{\text{sludge}}}\right) / \left(8,760 \frac{\text{hr}}{\text{yr}}\right) = 83.02 \frac{\text{ton}_{\text{sludge}}}{\text{hr}}$$

Neither of the SSIs at this facility have a capacity greater than the above rates, and therefore neither SSI will trigger CAM applicability for potential beryllium or mercury emissions.

4.2.5 CAM Applicability Conclusion

Based on the above analysis, both SSIs will trigger CAM requirements for PM emissions and NSPS Subpart O. The sand silo will not trigger CAM requirements.

4.2.6 CAM Plan

CAM plan submittal requirements: Per 02D .0614(d)(3), TZO must submit a CAM plan by the deadline specified in 40 CFR 64.5. Per 40 CFR 64.5(c), DAQ may require a CAM plan be submitted if the “part 70 or 71 permit [*i.e.*, a Title V permit] is reopened for cause by EPA or the permitting authority [*i.e.*, DAQ] pursuant to 40 CFR 70.7(f)(1)(iii) or (iv).” 40 CFR 70.7(f)(1) states that “A permit shall be reopened and revised under any of the following circumstances:...(iii) The permitting authority or EPA determines that the permit contains a material mistake or that inaccurate statements were made in establishing the emissions standards or other terms or conditions of the permit.” As discussed in Section **Error! Reference source not found.**, the inclusion of the permit shield for CAM was a material mistake, and therefore the permit is being reopened for cause to correct the mistake. Therefore, per 40 CFR 64.5(c), DAQ requested the CAM plan be submitted at this time.⁹

Proposed CAM plan: TZO submitted a CAM plan on June 21, 2023. The CAM plan proposes to follow the monitoring requirements of 40 CFR Part 62 Subpart LLL:

“[TZO] proposes that the monitoring required under 40 CFR Part 62 Subpart LLL for particulate matter (PM) be used to demonstrate compliance with 40 CFR Part 60 Subpart O because the PM emission standard under Subpart LLL is more stringent than the PM emission limit under Subpart O.”¹⁰

As justification that this more stringent monitoring is acceptable for CAM, TZO points to the preamble to 40 CFR Part 64:

“The [United States Environmental Protection] Agency notes that if emission limitations or standards other than the exempt emission limits described above apply to the same pollutant-specific emissions unit, the owner or operator would still be subject to part 64 for that pollutant-specific emissions unit and may have to upgrade the existing monitoring or add other types of monitoring. The Agency believes that for many situations in which both exempt and non-exempt emission limits apply to

⁹ Under most circumstances, a CAM plan is required with the first Title V permit renewal. See 40 CFR 64.5(b).

¹⁰ Email (June 21, 2023) from Keith McCulloch (Director/Principal for GEL Engineering, a firm representing TZO) to Russell Braswell (Engineer, DAQ).

a particular pollutant-specific emissions unit, the monitoring for the exempt limit may be adequate to satisfy part 64 for the other non-exempt emission limit(s). Section 64.4(b)(4) of the rule recognizes this possibility and allows the owner or operator to meet the obligation to explain the appropriateness of its proposed monitoring by stating that it is proposing monitoring for non-exempt limits that is based on the monitoring conducted for certain types of exempt emission limits.” (54900 Federal Register / Vol. 62, No. 204 / Wednesday, October 22, 1997)

The CAM plan proposed by TZO uses scrubber pressure drop and scrubber liquid flow rate as the performance indicators, with indicator ranges based on the most recent performance tests. The proposed CAM plan will be incorporated into the permit.

4.2.7 Changes to the current permit:

A specific condition for CAM will be added to the permit. The specific condition will incorporate the CAM plan submitted by TZO.

4.3 15A NCAC 02D .1110 “National Emission Standards for Hazardous Air Pollutants” (NESHAP)

This rule incorporates the NESHAP rules under 40 CFR Part 61 into North Carolina’s SIP. There are two NESHAP rules that apply to this facility: Subparts C and E. The Title V permit includes the requirements for both of these rules in a single specific condition.

4.3.1 NESHAP Subpart C “National Emission Standard for Beryllium” and Subpart E “National Emission Standard for Mercury”

Applicability: Subpart C applies to facilities that operate incinerators that process beryllium-containing waste. Subpart E applies to facilities that incinerate wastewater sludge. Each of the SSIs at this facility are subject to this rule.

Changes to the existing permit: DAQ has determined that compliance with both of these rules can be demonstrated by complying with the beryllium and mercury requirements under 15A NCAC 02D .1204. This application is proposing changes to the compliance methods under 15A NCAC 02D .1204, but those proposed changes will not affect TZO’s compliance requirements for NESHAP Subparts C and E. Therefore, no revision to the permit is required for these rules.

4.4 15A NCAC 02D .1204 “Sewage Sludge Incineration Units”

Background: Broadly speaking, the requirements of this rule are based on 40 CFR Part 60, Subpart M “Emission Guidelines and Compliance Times for Existing Sewage Sludge Incineration Units.” Note that Subpart M itself does not have an applicability requirement; the only way for this rule to apply to a source is if another rule (e.g., 02D .1204) references this rule.

Applicability: This rule applies to SSIs that meet the requirements in 40 CFR 60.5060(a) through (c). Both SSIs at this facility are subject to this rule.

Emission limits: This rule includes emission limits for several pollutants. Application .21C focuses on demonstrating compliance with the emission limits for hydrogen chloride (HCl) and sulfur dioxide (SO₂). The limits for these pollutants are incorporated from 40 CFR 60.5165. Therefore, the emission limits for HCl and SO₂ are exhaust concentrations not exceeding 0.51 ppm and 15 ppm, respectively.

Compliance requirements: TZO is required to demonstrate compliance with the emission limits by operating and monitoring wet scrubbers and maintaining minimum temperatures within the SSIs. TZO has performed new emission testing (test reference numbers 2022-005ST and 2022-051ST) on the SSIs and associated wet scrubbers. TZO has requested that the parameters determined during those tests be incorporated into the permit:

ID No.	Parameter	New Value	Requested in Application
CD-20	Minimum lower liquid injection rate	110 gpm	.22A
	Minimum upper liquid injection rate	178 gpm	
CD-21	Minimum liquid injection rate	259 gpm	
	Minimum pressure drop	8.1 inches of water column	
CD-22	Minimum pH	3.2 ¹¹	.22B
	Minimum scrubber flow rate	461 gpm ¹²	.23A
	Minimum pressure drop	37 inches of water column	.22B & .23A
ES-1	Minimum temperature (freeboard area)	1,497 °F ¹²	.23A
	Maximum temperature (freeboard area)	1,822 °F ¹²	
	Minimum temperature (combustion chamber)	1,289 °F ¹²	
	Maximum temperature (combustion chamber)	1,572 °F ¹²	
ES-20	Minimum temperature (freeboard area)	1,547 °F	.22A
	Maximum temperature (freeboard area)	1,875 °F	
	Minimum temperature (combustion chamber)	1,275 °F	
	Maximum temperature (combustion chamber)	1,545 °F	

In addition to the above parameter updates, TZO requested in application .21C to use an SO₂ CEMS to demonstrate compliance with the SO₂ emission limit. By doing so, the application states that continuous pH monitoring of the scrubber liquid will not be required:

- a. Under 02D .1204(f)(1), TZO is required to meet the operating limits and requirements of 40 CFR 60.5170.
- b. According to §60.5170(b), TZO is required to monitor each parameter established in accordance with §60.5190.
- c. According to §60.5190(a), a facility is not required to establish certain operating parameters if the facility employs a CEMS.
- d. According to §60.5190(d), for scrubbers used to comply with the SO₂ and HCl emission limits, the facility must monitor the scrubber liquid pH.

¹¹ This parameter was included in the .23A application. Because TZO will operate an SO₂ CEMS in the future (as requested in the .21C application) this parameter is no longer necessary, and will not appear in the modified Title V permit.

¹² See Note 1.

- e. However, according to §60.5190(a)(1), for scrubbers used to comply with the SO₂ and HCl emission limits, there is no operating limit for scrubber flow¹³ and scrubber pH if the facility uses a CEMS to demonstrate compliance with an emission limit for SO₂ or HCl.

Therefore, if TZO chooses to demonstrate compliance with the SO₂ emission limit using an SO₂ CEMS, there is no requirement to monitor the scrubber liquid pH. The requirements for using a CEMS to demonstrate compliance are included in 02D .1204(i) and (j), which reference 40 CFR 60.5205 and 60.5220.

Changes to the existing permit:

- The parameters listed in Section 2.1 A.4.c and 2.1 A.4.v.xi of the existing permit will be updated to the values listed in the above table.
- References to pH monitoring will be removed from Section 2.1 A.4.c.
- TZO requested that the table in Section 2.1 A.4.c of the permit include the data averaging period. Based on Table 4 to 40 CFR Part 60, Subpart M, the data averaging period for each parameter will be a 12-hour block average. This information will be added to the table.
- Based on the Title V permit issued to City of High Point – Eastside Wastewater Treatment Plant (permit 08074T16), a column for “allowable variance” will be included in the parameter table.
- The following paragraph regarding the use and operation of SO₂ CEMS will be added to the permit:

2.1 A.4: 15A NCAC 02D .1204: SEWAGE SLUDGE INCINERATION UNITS

...

Continuous Emission Monitoring Systems [15A NCAC 02D .1204(f), (i), and (j)]

- n. As allowed by 40 CFR 60.5185(b) and 40 CFR 60.5190(a), the Permittee shall demonstrate compliance with the SO₂ and HCl limits in 2.1 A.4.a, above, by installing, operating, calibrating, and maintaining a continuous emission monitoring system (CEMS) for SO₂.
- i. When demonstrating initial compliance using the CEMS, the Permittee shall follow the procedure in 40 CFR 60.5185(b).
- ii. As allowed by 40 CFR 60.5190(a)(1), the Permittee is not required to establish an operating limit for scrubber liquid pH when demonstrating compliance using the SO₂ CEMS.
- iii. The Permittee shall demonstrate continuous compliance using the SO₂ CEMS as allowed by 40 CFR 60.5205(b)(1).
- iv. The Permittee shall operate the SO₂ CEMS according to the requirements in 40 CFR 60.5220(b):
(A) The CEMS shall be installed, operated, and quality assured according to the requirements in 40 CFR 60.5220(b)(3).
(B) The Permittee shall follow the relative accuracy test run procedures in 40 CFR 60.5220(b)(4).
(C) The Permittee shall operate the CEMS and collect data using the CEMS as required in 40 CFR 60.5220(b)(6).

¹³ Note that scrubber flow must be monitored for compliance with *all* applicable emission limits (see §60.5190(b)). Because TZO will only be operating a CEMS for SO₂, and the scrubbers are used to comply with other emission limits, the requirement for monitoring scrubber flow remains in effect.

4.5 15A NCAC 02Q .0512 “Permit Shield and Application Shield” [not applicable]

Applicability: As allowed by 02Q .0512(a), DAQ may include a paragraph in a Title V permit that states that specific rules are not applicable to the Permittee (i.e., a “permit shield”). The existing permit includes a permit shield for 02D .0614.

Changes to the existing permit: As discussed in Section 4.2, above, the basis for the permit shield in the existing permit is erroneous. Therefore, the permit shield section will be removed from the new permit.

4.6 40 CFR Part 62, Subpart LLL “Federal Plan Requirements for Sewage Sludge Incineration Units Constructed on or Before October 14, 2010”

Background: This rule only applies if the state in which the SSI is located does not have an approved rule for SSIs. Although North Carolina has a rule for SSIs (02D .1204), that rule has not been approved by EPA. Therefore, TZO must comply with this rule.

This rule is not included in North Carolina’s rules under Chapters 02D or 02Q. However, this rule is enforceable by North Carolina through a memorandum of agreement between EPA and NC DAQ, signed April 2, 2018. Therefore, DAQ must include this rule in Title V permits when applicable.

Applicability: This rule applies to SSIs that were constructed before October 14, 2010 and have not been modified after that date. Both of the SSIs at TZO are subject to this rule. For the purposes of this rule, each SSI at this facility is an existing fluidized bed SSI controlled with scrubbers.

Compliance requirements: In general, the requirements of this rule are the same as the requirements for 02D .1204 and NSPS Subpart M MMM. The applicable emission limits in Table 2 to Subpart LLL are the same as the limits in NSPS Subpart M MMM. The methods of demonstrating initial and continued compliance are the same for both Subpart LLL and NSPS Subpart M MMM (including the use of an SO₂ CEMS in place of monitoring scrubber pH). Note that TZO is required to hold a Title V permit, regardless of major source status, under §62.16035.

Changes to the existing permit: A specific condition for Subpart LLL will be added to the Title V permit.

4.7 Summary of Changes

Page No.	Section	Description of Changes
Throughout	Throughout	<ul style="list-style-type: none"> Updated dates and permit numbers. Removed references to previous minor modifications. Fixed formatting where appropriate.
4	1.	<ul style="list-style-type: none"> Updated scrubber flow rates based on applications .22A and .22B. Removed “when associated with ES-1” from the description of CD-21. CD-21 only controls emissions from ES-20.
6	2.1 A.2.i	<ul style="list-style-type: none"> Updated parameters for scrubber pressure drop and incinerator oxygen content based on applications .22A and .22B. Added requirement that all instances of deviations must be clearly identified when submitting reports.
8	2.1 A.3 (new)	<ul style="list-style-type: none"> Added this specific condition for 15A NCAC 02D .0614 “Compliance Assurance Monitoring.” Renumbered subsequent sections.

Page No.	Section	Description of Changes
10	2.1 A.5	<ul style="list-style-type: none"> Updated parameters for incinerator operating temperature, scrubber pressure drop, and scrubber flow rate based on applications .22A and .22B. Removed pH monitoring requirement because Permittee will operate an SO₂ CEMS instead, as allowed by 40 CFR 60.5190(a)(1). Added SO₂ CEMS requirements based on application .21C. Added allowable variance to operating limit table based on Title V permit issued to City of High Point – Eastside Wastewater Treatment Plant (permit 08074T16).
16	2.1 A.7 (new)	<ul style="list-style-type: none"> Added specific condition for 40 CFR Part 62, Subpart LLL “Federal Plan Requirements for Sewage Sludge Incineration Units Constructed on or Before October 14, 2010.” Although this rule is not directly included in NC’s State Implementation Plan, this rule is enforceable by NC DAQ through a memorandum of agreement signed by NC DAQ and US EPA on April 2, 2018. In general, the compliance requirements for this rule are the same as for 15A NCAC 02D .1204.
n/a	2.3 (former)	<ul style="list-style-type: none"> Removed permit shield for 15A NCAC 02D .0614. The previous permit shield for this rule was based on the fact the Permittee is not a major source as defined by 40 CFR Part 70. However, major source status is not considered in the applicability of 15A NCAC 02D .0614, only that a facility is required to obtain a permit under 15A NCAC 02Q .0500 (i.e., a Title V permit).

* This list is not intended to be a detailed record of every change made to the permit but a summary of those changes

5.0 Compliance Status and Other Regulatory Concerns

Compliance status: This facility was most recently inspected on September 6, 2022 by Robert Barker. TZO appeared to be in compliance with the Title V permit at that time.

Compliance history: The Title V permit was most recently renewed on July 30, 2021. Since that date, TZO has been issued several Notices of Violation (NOV) and Notices of Recommendation to Enforce (NRE).

Date	Event	Notes
October 4, 2021	NOV/NRE	<p>TZO did not develop a site-specific monitoring plan as required by 02D .1204. TZO did not apply to have the permit modified to reflect the most recent test results. TZO was found to be operating below the minimum temperatures for ES-1.</p> <p>Although an NRE was issued, no enforcement action was taken. TZO submitted permit application .21D to resolve these violations.</p>
October 27, 2021	NOV/NRE	TZO exceeded the CO 24-hour block average limit of 64 ppm. TZO was fined \$24,457. The fine was paid on January 4, 2022.
May 12, 2022	NOV/NRE	TZO again exceeded the CO 24-hour block average limit of 64 ppm. TZO was fined \$8,457. The fine was paid on August 3, 2022.

Application fee: Applications for significant and minor modification require an application fee.

- The required fee for application .21C (\$1,002) was received electronically on February 14, 2022.
- The required fee for application .22A (\$3,090) was received electronically on April 13, 2022.
- The required fee for application .22B (\$7,210) was received electronically on August 1, 2022.
- The required fee for application .23A (\$3,327) was received electronically on August 24, 2023.
- There is no application fee for reopen-for-cause applications (.23B).

PE Seal: Pursuant to 15A NCAC 02Q .0112 “Application requiring a Professional Engineering Seal,” a professional engineer’s seal (PE Seal) is required to seal technical portions of air permit applications for new sources and modifications of existing sources as defined in 15A NCAC 02Q .0103. All applications were sealed by Keith D. McCulloch (#027343). Based on the NC Board of Examiners for Engineers and Land Surveyors license lookup tool, this license is current through December 31, 2023.

Zoning: A Zoning Consistency Determination per 15A NCAC 02Q .0304(b) was not required for these modifications because they do not involve expansion of an existing facility.

6.0 Facility Emissions Review

Title V: TZO is currently classified as a minor source under Title V (40 CFR Part 70.2) because it does not have potential emissions of any pollutant greater than the major source threshold. TZO has accepted a facility-wide emission limit in order to avoid being classified as a major source for Title V. These applications will not affect TZO’s status as a minor source under Title V. Note that, regardless of Title V major source status, TZO is required to hold a Title V permit under 40 CFR Part 62, Subpart LLL (see 40 CFR 62.16035).

HAP: TZO is currently classified as an area source of HAP (40 CFR 63.2) because it does not have potential HAP emissions greater than the major source thresholds. TZO has accepted a facility-wide HAP limit in order to avoid being classified as a major source of HAP. These applications will not affect TZO’s status as an area source of HAP.

PSD: TZO is currently classified as a minor source for PSD because it does not have potential emissions of any regulated NSR pollutant greater than 100 tpy. Note that the threshold is 100 tpy because TZO is a municipal incinerator capable of charging more than 50 tons per day, which is one of the listed categories in 40 CFR 51.166(b)(1)(i)(a). TZO has accepted a facility-wide emission limit such that all regulated NSR pollutants are less than the major source threshold. These applications will not affect TZO’s status as a minor source for PSD.

7.0 Draft Permit Review Summary

7.1 Initial draft

An initial draft of the permit and application review were sent to DAQ Permits staff (Rahul Thaker, Title V Supervisor) on February 3, 2023. Comments were received on March 10, 2023:

RCO comment 1: Typos and minor revisions in the draft permit and review.

Response: The indicated issues were corrected.

RCO comment 2: Does the draft permit include the applicable monitoring and operating requirements for the SO₂ CEMS?

Response: Yes. The permit already incorporates all of the monitoring, recordkeeping, and reporting requirements of 15A NCAC 02D .1204, which in turn covers all of the applicable monitoring and operating requirements for the SO₂ CEMS.

RCO comment 3: Update the control device descriptions in Section 1 based on the test results.

Response: The control device descriptions will be updated.

RCO comment 4: The permit condition for 40 CFR Part 62, Subpart LLL should include a summary table of parameters. Compare to City of High Point – Eastside Wastewater Treatment Plant (permit 08074T16).

Response: This table will be added to the draft permit.

RCO comment 5: The parameter table in the specific condition for 02D .1204 should include a column for “allowable variance.” Compare to City of High Point (above).

Response: This column will be added to the draft permit.

RCO comment 6: The CAM analysis in the draft review is incorrect. 1) the draft permit uses an emission factor for TSP for the SSIs. This should be PM₁₀ and PM_{2.5}, not TSP. 2) the CAM analysis should examine the impact of condensable PM. 3) A state-enforceable rule (02D .1204) cannot trigger CAM applicability.

Response: The CAM analysis will be updated. CAM will still apply to the SSIs, but the analysis will be based on the correct emission factors.

7.2 Second draft

A revised draft of the permit and review were sent to DAQ WSRO staff (Robert Barker, Davis Murphy), SSCB staff (Samir Parekh), and TZO staff (Keith McCulloch, Bradly Flynt).

WSRO comment: The draft permit has the wrong temperature for the minimum freeboard area for ES-1.

Response: The indicated issue was corrected.

SSCB comment: DAQ should not wait until the next Title V renewal to incorporate a CAM plan. DAQ should incorporate the CAM plan according to 40 CFR 64.5(c) using reopen-for-cause under 02Q .0517.

Response: A reopen-for-cause permit application will be initiated by DAQ.

7.3 Third draft

A new draft of the Title V permit and this review were prepared after TZO submitted a CAM plan. The new draft was sent to DAQ Permits staff and DAQ SSCB staff.

SSCB comment: The proposed CAM plan is acceptable. The summary table in Section 2.1 A is missing a line for CAM and 40 CFR Part 62 Subpart LLL.

Response: The summary table in Section 2.1 A of the permit will be corrected.

RCO comment: Typos and minor revisions in the draft permit and review.

Response: The indicated issues were corrected.

7.4 Final draft

A final draft of the Title V permit and this review were prepared after addressing the above comments. This final draft was sent to TZO staff and DAQ WSRO staff. DAQ WSRO staff had no comments on this final draft. TZO provided the following comments:

TZO comment 1: Note that CD-21 only controls emissions from ES-20. When CD-22 was installed, the connection from ES-1 to CD-21 was dismantled.

Response: The reference to ES-1 in the description of CD-21 will be removed from the equipment list in Section 1 of the permit.

TZO comment 2: Corrected the flow rates for CD-21 in Section 1 of the permit.

Response: The permit will be updated based on this information.

TZO comment 2: The table of operating limits in Section 2.1 A.5.c should include the data averaging period.

Response: This information will be included in the table. The table will also include a footnote clarifying that the data averaging periods come from Table 4 to 40 CFR Part 60, Subpart Mmmm.

TZO comment 3: The CAM applicability discussion in the application review for Silo ES-17 includes a process rate of 48 tons per hour. March 2014 Title V application and all subsequent applications stated the maximum load rate is 24 tons/hr which equates to pre-control emissions of 49.41 tpy.

Response: The application review will be updated based on this information.

8.0 Public Notice and EPA Review

A notice of the draft Title V Permit shall be made pursuant to 15A NCAC 02Q .0521. The notice will provide for a 30-day comment period, with an opportunity for a public hearing. Consistent with 15A NCAC 02Q .0518(b), the EPA will have a 45-day review period. Based on an agreement between DAQ and EPA, this period will generally coincide with the 30-day public notice period. Copies of the public notice shall be sent to persons on the Title V mailing list and EPA. Pursuant to 15A NCAC 02Q .0522, a copy of each permit application, each proposed permit and each final permit shall be provided to EPA. Also, pursuant to 02Q .0522, a notice of the draft Title V Permit shall be provided to each affected State at or before the time notice is provided to the public under 02Q .0521 above. DAQ voluntarily provides notice to each bordering State (Virginia, Tennessee, Georgia, and South Carolina).

- The Public Notice and EPA Review periods began on XXXXXXXX.
- The Public Notice period ended on XXXXXX.
- The EPA Review period ended on XXXXXX.

9.0 Recommendations

This permit application has been reviewed by NC DAQ to determine compliance with all procedures and requirements. NC DAQ has determined that this facility appears to be complying with all applicable requirements.

This permit engineer recommends issuance of Permit No. 04489T29. WSRO, SSCB, and TZO have received a copy of this permit and submitted comments that were incorporated as described in Section 7.0.

DRAFT